West Nile Virus

WHAT IS THE HEALTH ISSUE?

The epidemic and epizootic of West Nile virus (WNV) disease, which began in the summer of 1999, underscores the ease with which emerging infectious pathogens can be introduced into new areas. The persistence of WNV activity in the United States indicates that WNV has become established in North America. Since its introduction, WNV has caused the largest ever continuing human flaviviral epidemic in recent U.S. history, reinforcing the need to rebuild and sustain the public health infrastructure to deal with vector-borne diseases in this country. In 2004, extensive severe disease activity continued and expanded into California and Oregon. To date, over 16,000 cumulative human WNV infections have been reported to CDC.

WHAT HAS CDC ACCOMPLISHED?

- ***Surveillance and Response:*** CDC evaluates, revises, and publishes national guidelines for surveillance, prevention, and control of WNV on a continuing basis, issuing the 3rd update during 2003. Using a national electronic surveillance system (ArboNet), CDC works with local and state health departments to track WNV infections in humans, birds, mosquitoes, horses, and other animals. Data from ArboNet guided prevention and control activities at the state and local level during 2004. Continually updated information on WNV surveillance is available to the public and health professionals on CDC's website (www.cdc.gov/westnile) and a collaborative CDC/U.S. Geological Survey site (www.westnilemaps.usgs.gov).
- ***Applied Research:*** CDC developed and implemented new laboratory tests to detect the presence of WNV antigen in human, avian, veterinary, and mosquito specimens. CDC continued to monitor the genetic evolution of WNV worldwide and identified novel routes of WNV infection, including tissue transplantation and blood transfusion. CDC funded six new awards to universities and health facilities for applied research to study the public health aspects of WNV in the United States. CDC scientists continued work to further characterize the behavior of the *Culex* vector mosquito and identify the most effective mosquito control measures.
- ***Infrastructure and Training:*** CDC provided funding to 56 state and local health departments to enhance epidemiologic and laboratory capacity for surveillance of and response to WNV infection and other arboviral diseases. This funding improves the overall readiness to response to vector-borne diseases. CDC also funds cooperative agreements for training in medical arbovirology at four universities. Formal training courses have been held in laboratory diagnosis of WNV infection and in medical entomology. CDC has sponsored five national meetings on WNV, with the sixth occurring in February 2006.
- ***Prevention and Control:*** CDC has promoted an integrated strategy for prevention and control of WNV, including large-scale emergency plans for mosquito control to be used by states in response to a large human outbreak. CDC funded and collaborated in the development of informational and educational materials for the public and health care workers. Testing of all blood donations in the U.S. began in July, 2003 to respond to the risk of WNV transmission through blood transfusion and organ donation identified in 2002. CDC worked closely with the Food and Drug Administration (FDA), the Health Resources and Services Administration (HRSA), blood collection agencies, state and local health departments, and the pharmaceutical industry to implement this testing. Results indicate the testing substantially reduced the risk of transfusion-associated WNV infection by removing hundreds of units of potentially infectious blood products donated by asymptomatic donors.

WHAT ARE THE NEXT STEPS?

WNV is now established in North America, with a geographic range stretching from coast-to-coast and into Latin America, the Caribbean, and Canada. Effective systems are needed to ensure (1) expanded monitoring for WNV and other arboviral diseases in North America, and (2) further development of prevention and control measures, including integrated pest management, public education, optimal mosquito control measures, vaccines, and antiviral therapy. Further research on the basic biology of the virus and its natural ecology is needed and is being pursued.

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